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ABSTRACT

This report summarizes a project conducted by a group of catalogers from film archives devoted to nitrate preservation, which explored ways of developing a database to provide a complete film and television information service that would be available nationwide and could contain filmographic data, information on holdings in archives and corporations, and current information on access, availability, and distribution. The archive would provide a means of sharing information about holdings of archival film materials in the significant film collections in the United States. Discussion covers background history and preexisting work, planning concepts, and implementation, expansion, and operation of the national database. A summary and short-term recommendations are provided. Appendices include the North American Film and Television Computer Questionnaire Results; the minimum data list for film and television developed at the Second Film and Television Archival Cataloging and Documentation Meeting (American Film Institute, November 1981); the agenda and participant list of a meeting at the Museum of Modern Art (February 1983); an article entitled "MARC Formats--Underlying Principles"; and an article entitled "Film Preservation: A Large Piece of Americana is Fading Away." (LMM)

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TOWARD A NATIONAL COMPUTERIZED DATABASE FOR MOVING IMAGE MATERIALS

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Report: Toward a National Computerized Database for Moving Image Materials

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Introduction

Today, there is an ever-growing, urgent need to share information about holdings of archival film materials in the significant film collections in the United States. Archives contain many rare and precious, as well as decomposing and fading, records of our film heritage which are only now being rescued from the ravages of time through aggressive acquisition and preservation policies. Once they are restored, these films can then be made available to a wide national audience covering a broad range of artistic and aesthetic, cultural and historical concerns. Scholars view materials through facilities in the archives, and with permission of donors and copyright owners, the archives exhibit their films in their theaters, and films are loaned between archives and are made available to film festivals, filmmakers and other users.

Film cataloging is the least visible activity of a film archive. Yet, an accurate, professional description of both filmographic and technical information about the collections is the pivot upon which the other activities depend. There is an increasing awareness among archivists of the need to establish a system for the interchange of data among institutions. In this way, more informed decisions about preservation and cataloging priorities can be made, and duplication of preservation and cataloging effort may be avoided. Archives may better aid each other in the identification of films, and preservation staff will be better able to assess the technical aspects of their own copies in relation to copies of the same film held elsewhere. Scholars, researchers, and the public will have better knowledge of, and easier access to, the rich resource of films in archives.

Background History and Pre-Existing Work

In recent decades, archives have been inundated with ever-increasing quantities of film materials acquired from production companies, distributors, television stations, private citizens and other individuals and institutions. Cataloging staff responsible for gaining inventory and bibliographic control over these materials have been hampered by insufficient staff, limited funding, and inadequate institutional support to carry out these tasks. With the national collection of our moving image heritage scattered throughout numerous repositories in the United States, catalogers realize these problems are not ones of just local concern within each institution. In response to this, 74 catalogers representing 34 institutions met at a conference at The American Film Institute in November 1978 in order to share their experiences more fully and to discuss common problems.

At this meeting, the participants expressed a strong desire to develop a forum which would encourage continuing discussion. They decided that communication could best be achieved through the establishment of working groups, and proceeded to organize committees on computerization, minimum data, and subject access.

The computer committee met in the fall of 1979 at The Museum of Modern Art, and surveyed the state of computerization in various archives throughout the United States. The results of that survey (Appendix A) show a great desire to share information, but also a great divergence in the use of computer systems, both in the hardware and software. No two institutions used the same system, which could enable the direct exchange of data. This lack of compatibility is due to a number of factors: the absence of an adequate computer system for the archival cataloging of moving image materials, the high costs of computerization, and the imposition of different systems by parent institutions on catalogers of moving image materials. The approach has been to modify existing systems, which in most cases were designed either with more general tasks in mind, or for materials not as complex as those of film and television.

The working committees established at the 1978 AFI conference gathered again at The American Film Institute in November 1981 to discuss progress since the 1978 meeting. Additional groups were created to work on terminology and other areas of interest. Workshops were held on copyright and computerization, including practical demonstrations of computer methods actually in use in different archives.

It became clear that sharing data about holdings required, as a first step, the agreement by archive catalogers on a list of minimum data

elements to be used for information exchange. Through the work of the minimum data committee, such a list was created, reviewed, and approved by the group at the second cataloging conference (Appendix B).

Following the approval of the minimum data list, the group addressed the importance of standardized cataloging rules. With NEH support, extensive work in data standardization has already been carried out through The Council of National Library and Information Associations' Joint Committee on Specialized Cataloging. The participants urged that this effort be continued, provided the problems particular to the archival, in contrast to library/media center cataloging of film materials would be addressed.

With further support from the NEH, a number of meetings were held at the Library of Congress in 1982, under the aegis of The Council of National Library and Information Associations. Several committees met in order to review first drafts of interpretive manuals of the Anglo-American Cataloging Rules - 2 (AACR2) for archival cataloging of various materials. A finalized draft of the moving image materials manual, now in progress, will be reviewed by the Processing Services Department of the Library of Congress, and subsequently circulated to the field for final comment and suggestions. With the completion of this essential work, data standardization will be achieved, laying the groundwork for efficient information exchange between both established and recently developed archives for moving image materials.

Finally, with support from the NEA, representatives from the major American film archives holding nitrate materials, together with computer consultants experienced in establishing automated collections management activities in these institutions, met at The Museum of Modern Art on February 22 and 23, 1983. This group laid groundwork for the development of a national network to share preservation, cataloging and holdings information among film archives in the United States (See Appendix C for a list of participants and agenda). This report, resulting from that meeting, was written by the organizers in consultation with the other participants.

Toward a National Database: Planning Concepts

The database would address three kinds of uses. The most pressing need within the archives themselves is for information about holdings, especially nitrate films which are the most endangered moving images in archives, and therefore in the most urgent need of preservation. This minimal cataloging information would provide a basis for shared cataloging and the elimination of duplication of cataloging effort between institutions. However, minimal cataloging is not a substitute for full descriptive cataloging and subject analysis, which would ultimately provide maximum access and use of these collections. Finally, a National Database would answer research needs of third parties ranging from those of the traditional users of archival materials (scholars, researchers, filmmakers, etc.) to those of the general public itself. The number and kinds of users would increase as the database expanded and became capable of providing more and more of the information which they require.

The kinds of data stored in such a database would be influenced by the needs of the users and the related cost implications. The central database should only accept records cataloged at least to the minumum level stage. However, records cataloged more fully, including those with subject analysis and detailed credits, should also be added, as they form the basis for the authoritative record in the central system. More detailed catalog records will greatly ease the burden of gaining control over collections of new acquisitions and for updating and refining minimally cataloged titles to a more sophisticated and detailed level. Through the centralized database, cataloging of filmographic information can be more logically divided between the archives. Moreover, where duplicate holdings exist, the necessity to catalog the same title numerous times would be eliminated. A centralized database would enable archives to retrieve the filmographic record and add the physical holdings data pertaining to that archive.

Ideally this database could grow into a complete film and television information service, available nationwide to any interested party. The database could contain complete information on all films and television programs: filmographic data, information on holdings in archives, corporations, and other institutions, as well as current information on access, availability, and distribution. Such a system linked with information about available documentation materials relating to the films and television programs would provide an extremely important research tool. This large database should ideally be user friendly, should support online input, editing and queries within a reasonable response time, should maintain thesauri for names and subject terms, and should have the ability to generate various outputs, including special printed reports, microfiche and card records, as well as magnetic tape for preparing printed publications.

This national database would function best as a networked system, with each participating institution maintaining its own computers and contributing to a common data file in a central computer. The largest institutions committed to nitrate preservation -- The Museum of Modern Art (MOMA), The American Film Institute (AFI), the UCLA Film and Television Archives (UCLA), the International Museum of Photography at George Eastman House (IMP/GEH), the Library of Congress (LOC), and the National Archives (NARS) -- have already made extensive commitments to developing, maintaining, or changing their computer software and hardware systems. Moreover, immediate collections management needs (such as for inventory control and preservation) are most economically handled at the local level, rather than by a large centralized database. Additionally, certain information would best be kept at the local rather than the national level, particularly if this information were only of use to the individual institution. Given the nigh levels of financial, personnel, and programming investment in existing computer systems, as was shown from the computer survey (Appendix A), it is doubtful that all these diverse systems could ever be totally replaced by a new common system of identical hardware/software configurations at each institution.

Implementation of the National Database

The establishment of a National Database is clearly a major undertaking, which will require long-term commitments, planning, work, and funding. Acknowledging this reality, the focus of the MOMA meeting was to establish useful, practical steps that could lead to a large integrated system.

The MOMA planning group focused first on the immediate users: archives contributing to a shared data base for preservation and cataloging purposes. In order to share data on holdings in the archives, the information must be captured systematically, converted to a standardized form for communication, and merged with other information in a central database.

The amount of available filmographic and technical information about individual holdings varies from archive to archive. In general, those with the largest collections have the greatest backlog of uncataloged materials. The Library of Congress has, for example, approximately 30,000 titles with only minimal (accessions level) control in its backlog. UCLA has recently completed a shelf-list inventory of approximately 40,000 titles in its film and television collections, and considerable cataloging effort will be required to bring this information up to the level of the minimum data list. Greatly increased financial commitment to additional cataloging staff in each institution is necessary to insure the reliability, accuracy, and compatibility of records. With this support in bringing data at least to minimum level cataloging, major progress could be achieved. (For example, the Library of Congress would require $425,000 per year for each of five years for additional cataloging staff to keep current with new acquisitions and to eliminate existing backlogs. UCLA would require $100,000 per year for each of five years for additional cataloging staff to bring shelflist records to minimum cataloging levels.)

In order to communicate data between institutions via a central database in an efficient manner, a common format and accompanying rules are necessary. The basis for this exists in the MARC Format (see Appendix D), developed at the Library of Congress, which is the only national and international standard for the exchange of bibliographic and related data. Together with the interpretive manual of AACR2 rules for cataloging archival films, compatibility in data exchange will be assured. With this uniform format, previously incompatible computer systems will be able to exchange information by adding a MARC conversion software package, which will convert

internal data to MARC format for output to other systems, and accept incoming data in MARC format and convert it into the internal format of the local system. A software development cost of $40,000 is necessary to convert the archives' machine readable data into MARC format. It would cost an additional $30,000 to key in catalog records which meet the minimum data standard, but are not yet in machine readable form.

There are several options for the location of the central computer into which archives would contribute data from their local systems. These options are:

1. A public vendor or bibliographic utility such as Lockheed, BRS (Bibliographic Retrieval Services, Inc.), RLG/RLIN (Research Libraries Group/Research Libraries Information Network), or OCLC (Online Computer Library Center, Inc.).

2. Attached to an existing archive system such as those at MOMA, LOC, UCLA, IMP/GEH or AFI.

3. A new agency.

4. A combination of the above.

For example, for economic reasons, the database could initially be housed in one computer system, and then be converted to another computer system as the database grows. Estimates for the startup costs range from $250,000 to $1,000,000 for the first year, depending on which option proves most viable in terms of the requirements of the system. With emphasis on collecting data and on building the union database (input), rather than on sophisticated access (output), the initial development costs could be reduced. Generation of microfiche or COM (computer-originated microfilm) would be acceptable and inexpensive in the early stages.

Each of the above options has respective advantages and disadvantages, as well as related cost considerations (for example, some of the systems do not support online editing, and others do not presently support the full extent of cataloging required by the system). Therefore, the requirements for and uses of the system as previously discussed need further refinement so that the best choice will result. A consultant firm is necessary to work with the staff of the archives represented at the MOMA meeting to define more precisely the requirements of the system, to refine the alternate choices, and to recommend a system. Once the system is selected and funding secured, actual work of development, implementation, and testing may begin.

A draft list of the sequence of records that would be initially input into the database includes the following:

1. AFI Catalogs, 1920s and 1960s: filmographic records on 12,300 theatrical feature films produced and released in the United States. The AFI Catalog series should be completed as soon as possible, since it provides a central, complete source of filmographic data for all the institutions. This minimizes duplication of cataloging effort.

2. Library of Congress Kleine and Theodore Roosevelt Collections: 800 records in MARC format.

3. The Museum of Modern Art: 4,800 records in machine readable form, with 1,500 records still to be keyed in and another 1,500 records to catalog and input. Requires a conversion program into MARC format.

4. The International Museum of Photography at George Eastman House: 5,000 records (the entire collection). Requires a conversion program into MARC format. These records are not all at the level of the minimum data list.

5. The Library of Congress: 50,000 records, which must be manually rekeyed to MARC format.

6. The UCLA Film and Television Archives: 40,000 records with limited information. Needs cataloging staff to verify data and bring it up to minimum level cataloging. Requires computer input.

7. The Library of Congress: 45,000 additional records, not cataloged to the level of the minimum data list. Needs cataloging staff to verify data and bring it up to minimum level cataloging. Requires computer input.

8. AFI Catalogs for the Teens and successor volumes. Will be available in MARC format.

9. The Library of Congress Copix data for current film copyright registrations. Requires a conversion program to MARC format.

Expansion of the National Database

The database should later be expanded to include film and television holdings of other institutions. Important collections to be added exist in member institutions of the Film and Television Archives Advisory Committee and significant related collections, such as:

1. National Archives and Records Service (government documentary films, newsreels, and other nonfiction materials).
2. The Museum of Broadcasting (television programs).
3. Peabody Awards (20,000 television programs and 20,000 radio programs).
4. American Archives of Factual Film (6,000 films).
5. Academy of Motion Picture Arts and Sciences (more than 1,000 films).
6. Vanderbilt University (network television news).
7. Jewish Museum (broadcast materials relating to Jewish culture).
8. American Jewish Historical Society (films).
9. Dance Collection, New York Public Library (dance films and tapes).
10. Anthology Film Archives (avant-garde cinema art).
11. Public Television Archives (PBS).
12. Pacific Film Archive (motion pictures).
13. Video materials, amateur and art (such as in MOMA's collection).

Representatives of these and other relevant institutions should be consulted to coordinate their data with this project. Studio holdings should also be considered for inclusion. Finally, data on documentation materials such as scripts, posters, stills, pressbooks, and like material must be considered for inclusion, in consultation with experts in the field of film and television documentation.

Operation of the National Database

The process of collecting and merging all this data together is a complex one, as is the ongoing functioning of the central system. Two agencies will be required to oversee the entire project: 1) a systems operation staff, and 2) a steering committee. The systems operation staff would administer the project. Depending upon the configuration of the network, it could control and monitor the ongoing functioning of the computer(s), debug programs, write computer conversion routines, establish and maintain authority lists, gather data from new institutions, arrange for input of data from institutions with collections lacking computer control, and assure the standardized input of data.

The function of the oversight or steering committee would be to recruit the central agency staff, and to establish (1) the standards for data entry, (2) priorities for input, and (3) policy regarding output formats. The steering committee would be selected from among the chief catalogers of the participating archives.

To create and sustain the National Database for Moving Image Materials, extensive financial support over the period of at least a decade ("The Decade of Preservation") must be assured, on the order of 1 million dollars per year for each of ten years. This figure encompasses the support of cataloging activities at a local level to assure the quality of the cataloged records, the design and development of the central computer system, the conversion of records into it, and ongoing support for the operations staff to run it.

These costs are beyond the financial means of any individual archive. This project will succeed only with long-term commitment from a combination of public and private sources of new funding in addition to existing support for film preservation. For example, both Federal Endowments support film preservation and cataloging activities, and private foundations such as the Getty Trust aid cataloging projects for important collections of historic and cultural materials. Such organizations must work together with the oversight committee and each of the participating archives to assure the success of this project.

Because our national moving image cultural and artistic heritage is fading daily before our eyes, and because this unique creative, historical and social treasure is housed in many archives across the breadth of the nation, few projects are as urgent or as significant as a National Computerized Database for Moving Image Materials (Appendix E).

Summary: A National Computerized Database for Moving Image Materials

Use: Initially for the archives alone for basic bibliographic control for preservation activities, followed by sharing more detailed cataloging information to eliminate duplication of effort. Finally would come scholarly and public access.

Content: Because of the high costs of establishing and maintaining large shared databases, building a national moving image database should begin slowly, and proceed step-by-step. Accuracy of input data is a primary consideration, even if it initially means sacrificing quantity of information. The first level should consist of a basic filmographic record for preservation information which would comprise the minimum data elements, all of which could eventually be updated and expanded.

Once the initial information is loaded into the system, additional film and television holdings in other institutions should be added. The system should also be expandable to include corporate holdings and current distribution information as well as data about documentation materials on the films and television programs themselves. Each additional component added to the database would make it even more useful to non-archival users.

Standards: The network would follow guidelines, standards and rules already in existence or under development, specifically the above-mentioned minimum data list (see Appendix B), the MARC Films Format (see Appendix D), the AACR2 interpretive manual for archival cataloging of moving image materials currently being prepared at the Library of Congress, and principles established by the Cataloging Commission of the International Federation of Film Archives (FIAF).

Location: The available options are:

1. A public vendor or bibliographic utility such as Lockheed, BRS, RLIN, OCLC.

2. An existing archive such as MOMA, LOC, UCLA, IMP/GEH or AFI.

Location: (Continued)

3. A new agency.

4. A combination of the above.

Input: Data to be input must be in machine readable form and must be consistent with established archival standards. Where necessary, new programs must be written to translate existing machine readable databases into MARC format for transmission into and out of the central database. Provisions should be made for data capture from small collections which are not computerized.

Management: This would require:

1. A paid systems operation staff to monitor data, assure performance of the database, and effect updates and changes.

2. A steering committee, comprised of catalogers from the participating institutions.

Costs: $1,000,000 per year for each of ten years, supported by private sources and by the Federal Endowments. Funding for this project should be in addition to those funds supporting ongoing moving image preservation work.

Short-Term Recommendations

1. Develop in detail the strategy for proceeding with the further analysis and planning of this project. Specifically:

   a) Fund a computer consultant firm to work with the archives to refine user needs and narrow down systems options for a final choice, map out in more detail the phases of the project as outlined in this proposal, and estimate associated costs. Estimated cost: $25,000.

   b) Fund additional meetings and travel of the planning group to evaluate the results of the consultant firm's conclusions. Estimated costs: $10,000.

2. Support the work of the AFI Catalog project, in continuing to build the national filmography, because of its comprehensiveness and importance as a basis for film archival work.

3. Stimulate increased support for cataloging activities at the various archives, so that control over collections will be brought to the minimum level required for information exchange and so the ongoing cataloging and collections management work can be maintained at full levels.

4. Identify funding sources for the proposed central system.

APPENDICES

APPENDIX A

NORTH AMERICAN FILM AND TELEVISION COMPUTER COMMITTEE

QUESTIONNAIRE RESULTS

Introduction

With the rapid technological advances in the field of mini and micro computers, software packages, and backup support, a dramatic increase in the use of computer systems for archive records management during the past several years has occurred. The existence of working, automated systems in museums and libraries such as the Detroit Institute of Arts, the Boston Children's Museum, and the Yale Center for British Art indicates that the age of computerized cataloging for film and television materials is upon us. Film and television catalogers, too long isolated from each other because of the priority of cataloging the overwhelming quantities of in-house material, now desire to establish a network of communication.

As an outgrowth of the North American Film and Television Cataloging Conference held at the American Film Institutue in November of 1978, a computer committee was formed to investigate the ways in which information about film and television holdings might be shared among institutions and be made accessible to scholars and the public. The members of this Computer Committee are: Jon Gartenberg, The Museum of Modern Art (Chairperson); Wendy White, The Library of Congress (Questionnaire Coordinator); Jean Guenette, National Film Archive, Ottawa; Gwen Sloan, Consultant; and Chuck Sacks, Scriptorium. This committee met at The Museum of Modern Art in February of 1979 in order to discuss computerization problems and to plan strategy. We decided that our most important task was to conduct a questionnaire to determine the kinds of holdings and the extent of computerization in the 34 institutions represented at the Washington conference. The results of this questionnaire have now been compiled and edited, and are enclosed. We would like to give special thanks to Sarah Rouse and Harriet Harrison at the Library of Congress for editing and proofreading help.

Jon Gartenberg and Wendy White
April 1981

We have summarized the results of the questionnaire in the following manner:

A. List Of Institutions Responding .....p. 3

B. Types Of Materials Held By The Responding Institutions And Percent Under Computerized Control .....p. 4

C. Compatibility: Existing Systems And Planned Systems .....p. 6

D. Description Of Existing Systems .....p. 9

1. Manual Systems
2. Automated Systems

E. Subject Access .....p. 14

F. Sharing And Availability Of Resources .....p. 14

G. Suggestions For Future Work For The Committee .....p. 15

General Conclusions About Computers In Film And Television Institutions ..p. 16

Note: Numbers do not always correspond to expected totals both because not all archives completed every part of every question and because several archives are using a combination of manual and automated systems.

A. List Of Institutions Responding To Questionnaire

A total of 34 questionnaires were mailed to film and television archives in the United States and Canada. We had an excellent response of 70% or 24 institutions whose staff took the time to respond to the questionnaire.

1) AFI West (Los Angeles, Calif.)

2) Anthology Film Archives (New York, N.Y.)

3) Brigham Young University (Provo, Utah)

4) California Institute of the Arts (Valencia, Calif.)

5) Film Literature Index (Albany, N.Y.)

6) George Eastman House/International Museum of Photography (Rochester, N.Y.)

7) Library of Congress, Motion Picture, Broadcasting and Recorded Sound Division (Washington, D.C.)

8) Museum of Broadcasting (New York, N.Y.)

9) Museum of Modern Art, Department of Film (New York, N.Y.)

10) National Anthropological Film Center, Smithsonian Institution (Washington, D.C.)

11) National Archives and Records Service (Washington, D.C.)

12) Naval Photographic Center (McLean, Va.)

13) NBC (New York, N.Y.)

14) New York Public Library Theatre Collection (New York, N.Y.)

15) Public Archives of Canada (Ottawa, Canada)

16) PBS Public Television Program Archive (Washington, D.C.)

17) UCLA Film Archives and ATAS/UCLA Television Archives (Los Angeles, Calif.)

18) UCLA Theater Arts Library (Los Angeles, Calif.)

19) University of Southern California (Los Angeles, Calif.)

20) University of Georgia Peabody Collection (Athens, Ga.)

21) Vanderbilt Television News Archive (Nashville, Tenn.)

22) Walt Disney Archives (Burbank, Calif.)

23) Wisconsin Center for Film and Theater Research (Madison, Wis.)

24) Wisconsin State Historical Society (Madison, Wis.)

B. Summary Of Types Of Materials Held By The Responding Institutions And Percent Under Computerized Control

Type of Material Held in Collection	Number of Archives Holding Large Collections* (>1000 items)	Total Number of Archives Holding This Type of Material	Number of Archives Having No (0%), Minimal (<50%), >50%, and Total (100%) Computerized Control of Material Listed			
			0%	<50%	>50%	100%
Motion Picture Film	10	13	7	3	2	1
Television (Film and/or Video)	10	18	14	0	3	1
Other Video Material	1	8	7	0	1	0
Posters	5	10	10	0	0	0
Scripts	11	15	11	4	0	0
Music	2	8	7	1	0	0
Pressbooks	4	9	9	0	0	0
Clippings and Vertical Files	9	12	12	0	0	0
Manuscripts (Personal and/or Corporate Papers)	11	13	12	1	0	0
Stills	11	12	12	0	0	0
Other	8	10	7	1	1	1

* We chose 1000 items or a group of 11 or more collections as the number to distinguish large holdings. Inventory control becomes essential rather than simply desirable at this point.

Section "B" Comments/Conclusions

Archives abound with a multitude of rich resources of material. The most common and numerous holdings are motion picture films, television programs, scripts, manuscripts, clippings, and stills. Most institutions have no computerization. A few institutions (two) have 100% computerization for a given medium.

C. Compatibility: Existing And Planned Systems

System	In Use By:	Planned To Be Used By:
DAVIS	Naval Photographic Center	
GRIPHOS	Museum of Modern Art	
In-House Systems	NBC	Brigham Young University
"	University of Southern Calif.	PBS
"	National Archives*	UCLA Theater Arts Library
"	Museum of Broadcasting	UCLA Film ATAS/UCLA Television Archives
MARC	Library of Congress	
MARVEL		University of Georgia Peabody Collection
MINISIS		Public Archives of Canada (System being studied only - no immediate plans to implement)
OCLC	California Institute of the Arts	
"	New York Public Library/Theatre Collection	
"	UCLA Theater Arts Library	
SELGEM	Film Literature Index	
SPINDEX		Wisconsin State Historical Society
WILBUR (University of Rochester)	International Museum of Photography	

*Used for inventory control only.

Section "C" Comments/Conclusions

It has been generally assumed that computer systems in archives have been designed having compatibility with other systems in mind. The questionnaires indicate a lack of forethought in the development of existing systems and in the planning of future automated systems.

The only system mentioned as being compatible with existing or planned systems was MARC. The computerized cataloging systems at The Museum of Modern Art and the Museum of Broadcasting are supposed to be compatible with the Library of Congress' MARC system. The following institutions are planning compatibility with MARC: Brigham Young University, the Public Archives of Canada, UCLA Theater Arts Library, UCLA Film Archives and ATAS/UCLA Television Archives, and the University of Georgia Peabody Collection. The preceding chart clearly reveals that computer systems have been developed on an individual institution-by-institution basis, with no two institutions using the same system! Many are developing or have already developed in-house systems. There has been no study to determine whether any systems are in reality compatible with one another. Although the term is used freely by systems designers, one system is not compatible with another unless extensive planning and programming have made it so. A surprising number of respondents were not aware of the idea of compatibility; several did not consider it as a criterion in designing systems. If information sharing is a future goal, compatibility must be a factor in present planning and design.

Several institutions use one automated system for one medium and plan additional systems to control other media. OCLC (Ohio College Library Center) is used primarily for published books and serials and is inadequate for providing archival cataloging data for films and television material. Institutions

Section "C" Comments/Conclusions (cont.)

using OCLC are having difficulty developing new systems to provide cataloging for films, television, and other unique materials such as scripts, manuscripts, posters, and pressbooks. The lack of compatibility between computer systems will complicate sharing data among institutions. The Computer Committee is investigating the possibility of a general data base for which linkage programs from individual systems can be written. This work is being carried out in conjunction with the Minimum Data Committee.

D. Description Of Existing Cataloging Systems

1) Manual Systems

Questions and responses from institutions using manual systems only were as follows:

a) Are you part of a larger institution now using a computer system?

Yes:	11
No:	4

b) What percentage of your collections are under an acceptable control level? The responses were:

None:	Minimal - 50%:	50-90%:	>90%:
4	3	4	4

c) Could the information in your manual catalog be directly input into the computer?

Yes:	4
No:	7
Don't Know:	1
Not Applicable:	1
No Response:	2

d) Has your cataloging been done systematically?

Yes:	10
No:	5

Manual Systems - Comments/Conclusions

Of those institutions employing manual systems, 73% are part of organizations which have computer systems available to them. However, this does not mean that such systems are adaptable to film and television data needs. Experience with those institutions using computer systems would indicate that this task will not be easy. This fact is further complicated by the knowledge that most of the manual data are not at an acceptable control level (47% of the respondents have less than 50% of their material under an acceptable control level). Two-thirds of the institutions cannot input their information directly into a computer system for various reasons and one-third of the respondents have not used systematic cataloging rules to enter their data. These factors indicate that although computer systems are available within many of the organizations, it is absolutely essential that great amounts of time, additional cataloging support staff, the development of data standards and cataloging rules, and much preliminary cataloging work be done before computer input can even be considered.

Recommendations to manual catalogers considering using computer systems are as follows:

1) Be sure the parent institution's computer system is adaptable to the complexity of your cataloging needs.

2) Focus time, personnel, and money on developing cataloging standards and on the systematic application of these standards before computerization begins.

3) Test the data entered into the computer by examining the printed product at early stages and seek advice from other organizations already using computer systems.

4) Consult with the Minimum Data Committee regarding cataloging on a minimum data level (title, date, country, etc.). Minimum level cataloging may be the best method to gain inventory control over your holdings.

Manual Systems - Comments/Conclusions (cont.)

The lack of cataloging personnel is at a crisis level. Without essential, skilled personnel, staff use of the cataloging data and outside user demand cannot adequately be met. The departure of knowledgeable catalogers can cause serious handicaps to the maintenance and expansion of catalogs.

D. Description Of Existing Cataloging Systems (cont.)

2) Automated Systems

Questions and responses from institutions using automated systems were as follows:

a) Is your system part of a large computer system that serves other units or institutions? Or, is your system totally under your control, designed to serve your cataloging needs specifically?

Responses: 9 institutions answered that they were part of a larger system (including users of OCLC)

3 institutions are using their own independent systems

b) If you are part of a large system, do you feel you have enough flexibility to effectively serve your needs?

Responses: 5 institutions answered Yes
3 institutions answered No
1 institution said Yes and No

c) Is your system on-line, batch, or combination?

Responses: 3 - On-Line
5 - Batch
2 - Combination
2 - No Response (OCLC users)

Automated Systems - Comments/Conclusions

Most computer systems in film and television archives are part of larger systems within parent institutions. Most film and television catalogers believe their systems are flexible enough to serve their needs. However, additional comments indicate that this flexibility was the result of years of planning and battling within the institutions. The many divergent systems (see Section C) in use came about because most systems are part of larger systems within the institution. These larger systems were frequently developed for media other than film, television, and related documentation. It was cheaper to adapt programs to film and television material than to develop totally new software/hardware systems. The fact that a majority of archives are using a batch or combination system reflects the high cost of on-line systems and the low priority many administrators place on cataloging. The rapid development in the technology of on-line systems, mini/micro computers, and software packaging may result in a dramatic shift from batch to on-line use in the coming years.

E. Subject Access

Of the 12 institutions that have some kind of computerized cataloging system available to them (including OCLC) 8 include a systematic subject headings scheme. Of these 8, 5 are using Library of Congress subjects headings or a modification of that scheme. The remaining 3 are using in-house systems.

Of the 15 institutions using manual systems, 7 are using a systematic subject headings scheme; 8 have no subject headings scheme. All but one archive using manual systems have developed finding aids of some type.

Comments/Conclusions:

Not all of the respondents have subject access with computer systems. This lack indicates that subject access is not the most essential element of a catalog record. Moreover, the creation and maintenance of an adequate subject access system is expensive and complex. A majority of archives that do have subject access adapt the Library of Congress subject headings scheme because, although imperfect, it is established and workable.

F. Sharing And Availability Of Resources

Comments/Conclusions:

A majority (80%) of participants in the survey wish to share cataloging data. However, the ability to support the exchange of information, by funding and making available computer and staff resources, is severely limited by financial constraints and administrative reluctance.

G. Suggestions For Future Work For The Computer Committee

Summary of Suggestions (by frequency of response to questionnaire):

1) Publicize what other archives are doing, new systems, etc. Arrange for an exchange of information of the very practical procedures and problems involved in using various computer systems, including precise figures. Avoid re-inventing the wheel.

2) Make recommendations on planning, software, and hardware.

3) Investigate compatibility of various computerized systems, e.g., develop programs that can be used to compile lists of holdings of individual institutions (union lists); promote sharing of resources, e.g., develop some sort of data base for film and television literature which would be readily available to users.

4) Promote standardization, e.g., provide standardized cataloging forms.

5) Produce a bibliography of relevant journal articles on computerized cataloging.

6) Have FIAF information and recommendations about cataloging distributed to all interested organizations.

7) Develop an internationally accepted film cataloging system for computers that is efficient, not too costly, and includes a rational subject approach tailored specifically to film and video requirements.

General Conclusions About Computers In Film And Television Institutions

The enormous size of film and television collections, the complexity of the data, and the diverse demands from other staff members and outside users necessitates replacing manual systems with automated ones and updating outmoded automated systems currently in use. Film and television materials are more complex to catalog than most other media because of the complicated nature of the technical information required to identify, duplicate, and preserve them. The research required to verify titles and establish production and cast information is also often complicated and time-consuming. The questionnaire results indicate that before institutions can properly input their data into an automated system, greater amounts of time must be spent in extensive planning; additional staff must be hired and trained, and cataloging rules must be established. Of those institutions currently using some kind of computer system, not one has fully automated all its collections data. The additional time, staff, and research required in order to bring these records up-to-date is formidable in view of the fact that routine cataloging work is now at a crisis point in many archives.

Networking will encourage the communication of developments in the computer field and will facilitate the exchange of catalog records with other institutions. Additionally, networking will provide the most efficient means of coordinating and perhaps centralizing requests for funding. Institutions could then use their staff more effectively to eliminate backlogs and to research and organize other kinds of cataloging information unique to each institution, such as technical information, provenance, legal restrictions, etc. Modern computers will also enable film and television catalogs to be used to their fullest capacity. Complex searches may be performed, and records can be printed on microfiche, on cards, or

General Conclusions About Computers In Film And Television Institutions (cont.)

in list form far more rapidly and accurately than manual systems or outdated computer systems permit.

Those organizations already using computers have often been obliged to adapt already-existing systems used to catalog other works within a larger institution. While this has been an advantage in that the hardware and software have been developed already, there have also been great disadvantages. These computer programs have required great modification and expense to suit film and television cataloging needs. Although compatibility within a given institution is necessary, there is another priority, that of compatibility among film and television organizations in order to avoid duplication of cataloging efforts and to answer user/researcher queries more effectively.

The questionnaire results show that of the institutions using computer systems, little compatibility exists. The Committee's efforts will now be directed toward exploring the best means of sharing data among institutions, which may possibly require constructing a general data base or the linking of several already-existing large data bases. This work is being carried out in conjunction with the Minimum Data Committee, so that we may agree upon the elements which the standardized entries should include.

For further questions or information regarding the Computer Committee, please call or write:

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APPENDIX 5

MINIMUM DATA LIST FOR FILM AND TELEVISION
THE SECOND
FILM AND TELEVISION ARCHIVAL CATALOGING AND DOCUMENTATION MEETING
THE AMERICAN FILM INSTITUTE, WASHINGTON, D.C.
NOVEMBER 18-20, 1981

FILM

Title
1) Original release title in country of origin or identification surrogate.
2) Other relevant titles.

Date
1) Of the first public showing in country of origin. (Question for U.S. release: NY or LA?)
2) Copyright, if any
3) Production

Country of Origin
Countries of companies producing film (refine definition)

Production Credits
1) Production Company
2) Releasing Company
3) Director
4) Producer
5) Cast (at least 3)
6) Recommended: screenwriter, cinematographer, etc.

Physical Description
1) Base (acetate, nitrate, etc.)
2) Emulsion (print, negative, fine grain master, etc.)
3) Gauge (in mm)
4) Length (footage or running time)
5) P&W or color
6) Sound or silent

TELEVISION

Title
1) Original broadcast title in country of origin or identification surrogate.
2) Other relevant titles.

Date
1) Of the first broadcast.
2) Copyright, if any
3) Production
4) For foreign broadcasts, use American date, with note

Country of Origin
Same

Production Credits
1) Network or Station
2) Production Company
3) Producer
4) Director
5) Screenwriter
6) Talent (at least 3)

Physical Description
1) Format (disc or tape)
2) Gauge (in inches)
3) Running time
4) B&W or color
5) Sound or silent

APPENDIX C

MEETING AT THE MUSEUM OF MODERN ART, FEBRUARY 1983

List of Participants

Jon Gartenberg	The Museum of Modern Art (Organizer)
Larry Karr	The American Film Institute (Co-Organizer)
Harriet Harrison	The Library of Congress (Co-Organizer)
Wendy White	LOC (Co-Organizer)
Michael Godwin	LOC
Stephen Davis	LOC, Network Development Office
Andrew Eskind	International Museum of Photography/ George Eastman House
Allan Bobey	IMP/GEH
Candace Bothwell	IMP/GEH
Eddie Richmond	UCLA Film Archives
Lee Amazonas	MOMA
Ron Magliozzi	MOMA
Anne Morra	MOMA
Catherine Surowiec	MOMA
Les Marcus	Consultant
Gerald Reid	SEI-Hamilton Reid Associates
Peter Rooney	Consultant
Lenore Sarason	Willoughby Associates
Teri Varveris	Consultant
Laura Geary	MOMA (Assistant)

APPENDIX C (Continued)

MEETING AT THE MUSEUM OF MODERN ART, FEBRUARY 1983

Agenda

Jon Gartenberg of MOMA chaired the meeting, whose agenda was as follows:

I. Methodology

- A. Identification of Data Elements
- B. Data Standards and Rules
- C. Authority Lists/Standardized Names
- D. Subject Access
- E. Building a Database
  - 1) Permanent Data (Filmographic Information)
  - 2) Changeable Data (Holdings Information)
- F. Theoretic and Practical Aspects of Data Sharing
  - 1) Location of Database(s)
  - 2) Ownership of Database(s)
  - 3) Compatibility between Systems/Developing Uniform Formats
  - 4) Hardware
  - 5) Software
  - 6) Human Resources
    - a) Computer Programmers
    - b) Catalogers
    - c) Outside Support

APPENDIX C (Continued)

MEETING AT THE MUSEUM OF MODERN ART, FEBRUARY 1983

Agenda (Continued)

G. Database Management

1) Maintenance of Database

2) Updating the Database

3) Expanding the Database

4) Access to and Use of the Database

II. Cost Estimates

III. Time Frame

IV. Funding Sources

APPENDIX D

The USMARC Formats: Underlying Principles

The following statement of underlying principles for content designation in the USMARC formats was approved on October 29, 1982, by the American Library Association's RTSD/LITA/RASD Committee on the Representation in Machine-Readable Form of Bibliographic Information (MARBI), in consultation with representatives from the national libraries and bibliographic networks. This statement is intended to reflect those principles which account for the current state of the USMARC formats and to constitute a provisional set of working principles for further format development. The statement will be included as prefatory material in *MARC Formats for Bibliographic Data* and *Authorities: A MARC Format* and will be revised as necessary in the future.

1. Introduction

1.1. The USMARC Formats are standards for the representation of bibliographic and authority information in machine-readable form.

1.2. A MARC record involves three elements: (1) the record **structure,** (2) the **content designation,** and (3) the data **content** of the record.

1.2.1. The structure of USMARC records is an implementation of the *American National Standard for Information Interchange on Magnetic Tape* (ANSI Z39.2–1979) and of *Documentation—Format for Bibliographic Information Interchange on Magnetic Tape* (ISO 2709–1981).

1.2.2. Content designation—the codes and conventions established explicitly to identify and further characterize the data elements within a record and to support the manipulation of that data—is defined in the USMARC Formats.

1.2.3. The content of those data elements which comprise a traditional catalog record is defined by standards outside the formats—such as the *Anglo-American Cataloguing Rules* or the *National Library of Medicine Classification*. The content of other data elements—coded data (see section 9. below)—is defined in the USMARC Formats.

1.3. A MARC format is a set of codes and content designators defined for encoding a particular type of machine-readable record.

1.3.1. At present, USMARC formats have been defined for two distinct types of records. *MARC Formats for Bibliographic Data* contains format specifications for encoding data elements needed to describe, retrieve, and control various types of bibliographic material. *Authorities: A MARC Format* contains format specifications for encoding data elements which identify or control the content and content designation of those portions of a bibliographic record which may be subject to authority control.

1.3.2. The *MARC Formats for Bibliographic Data* are a family of formats defined for the identification and description of different types of bibliographic material. USMARC Bibliographic formats have been defined for Books, Films, Machine-Readable Data Files, Manuscripts, Maps, Music, and Serials.

1.3.3. The USMARC Formats have attempted to preserve consistency of content designation across formats where this is appropriate. As the formats proliferated and became more complex, however, definitions and usages have diverged. While complete consistency has not been achieved, a continuing effort is being made to promote consistent definition and usage across formats.

2. General Considerations

2.1. The USMARC Formats are communications formats, primarily designed to provide specifications for the exchange of records between systems. The communications formats do not mandate the internal formats to be used by individual systems, either for storage or display.

2.2. The USMARC Formats were designed to facilitate the exchange of information on magnetic tape. In addition, they have been widely adapted for use in a variety of exchange and processing environments.

2.3. The USMARC Formats are designed for use within the United States. An attempt has been made to preserve compatibility with other national formats. Lack of international agreement on cataloging codes and practices has made complete compatibility impossible, however.

2.4. The USMARC Formats serve as a vehicle for bibliographic and authority data of all types, from all agencies. Historically and practically, the formats have always had a close relationship to the needs and the practices of the library community. In particular, the formats reflect the various cataloging codes applied by American libraries.

2.5. Historically, the USMARC Formats were developed to enable the Library of Congress to

communicate its catalog records to other institutions. National agencies in the United States and Canada (Library of Congress, National Library of Canada, National Agricultural Library, National Library of Medicine, and Government Printing Office) are still given special emphasis in the formats, as sources of authoritative cataloging and as agencies responsible for certain data elements.

2.6. The institutions responsible for the content, content designation and transcription accuracy of data within a USMARC record are identified at the record level, in field 008, byte 39, and in field 040. This responsibility may be evaluated in terms of the following rule.

2.6.1. Responsible Parties Rule.

(a) Unmodified records: The institution identified as the transcribing institution (field 040 $c) should be considered responsible for content designation and transcription accuracy for all data. Except for agency-assigned data (see section 2.6.2.1. below), the institution identified as the cataloging institution (field 040 $a) should be considered responsible for content.

(b) Modified records: Institutions identified as transcribing or modifying institutions (field 040 $c,d) should be considered collectively responsible for content designation and transcription accuracy. Except for agency-assigned and authoritative-agency data (see section 2.6.2. below), institutions identified as modifying or cataloging institutions (field 040 $a,d) should be considered collectively responsible for content.

2.6.2. Exceptions.

2.6.2.1. Certain data elements are defined in the USMARC formats as being exclusively assigned by particular agencies (for example, International Standard Serial Number, Library of Congress Card Number). The content of such **agency-assigned** elements is always the responsibility of the agency.

2.6.2.2. Certain data elements have been defined in the USMARC Formats in relation to one or more **authoritative agencies** which maintain the lists or rules upon which the data is based. Where it is possible for other agencies to create similar or identical values for these data elements, content designation is provided to distinguish between values actually assigned by the authoritative agency and values assigned by other agencies. In the former case, responsibility for content rests with the authoritative agency. In the latter case, the Responsible Parties Rule applies, and no further identification of source of data is provided. Authoritative-agency fields are:

050 Library of Congress Call Number
060 National Library of Medicine Call Number
082 Dewey Decimal Classification Number
[DDC is maintained by the Library of Congress.]

2.7. In general, the USMARC Formats provide content designation only for data which is applicable to all copies of the bibliographic entity described.

2.7.1. Information which applies only to some copies (or even to a single copy) of a title may nevertheless be of interest beyond the institutions holding such copies. The USMARC Formats provide limited content designation for the encoding of such information and for identifying the holding institutions (see, for example, subfield $5 in the 7XX fields).

2.7.2. Information which does not apply to all copies of a title, and is not of interest to other institutions, is coded in local fields (such as field 590).

2.8 Although a MARC record is usually autonomous, data elements have been provided containing information which may be used to link related records. These linkages may be implicit, through identical access points in each record, or explicit, through a linking field. Linking fields (76X–78X) may contain either selected data elements which identify the related item or a control number which identifies the related record. An explicit code in the Leader identifies a record which is linked to another record through a control number.

3. **Structural Features**

3.1. The USMARC Formats are an implementation of the *American National Standard for Information Interchange on Magnetic Tape* (ANSI Z39.2–1979). They also incorporate other relevant ANSI standards, such as *Magnetic Tape Labels and File Structure for Information Interchange* (ANSI X3.27–1978).

3.2. All information in a MARC record is stored in character form. USMARC communication records are coded in Extended ASCII, as defined in Appendix III.B of *MARC Formats for Bibliographic Data*.

3.3. The length of each variable field can be determined either from the "length of field" element in the directory entry or from the occurrence of the "field terminator" character [$1E_{16}$, 8-bit; 36_8, 6-bit]. Likewise, the length of a record can be determined either from the "logical record length" element in the Leader or from the occurrence of the "record terminator" character [$1D_{16}$, 8-bit; 35_8, 6-bit]. (In the past, the field terminator of the last field was omitted, and the record terminator identified the end of that field.) The location of each variable field is explicitly stated in the "starting character position" element in its directory entry.

4. **Content Designation**

4.1. The goal of content designation is to identify and characterize the data elements which comprise a MARC record with sufficient precision to support manipulation of the data for a variety of functions.

4.2. For example, MARC content designation is designed to support such functions as:

(1) Display—the formatting of data for display on a CRT, for printing on 3x5 cards or in book catalogs, for production of COM catalogs, or for other visual presentation of the data.

(2) Information retrieval—the identification, categorization, and retrieval of any identifiable data element in a record.

4.3. Some fields serve multiple functions. For example, field 245 serves both as the bibliographic transcription of the title and statement of responsibility and as the access point for the title.

4.4. The USMARC Formats provide for display constants (text which implicitly accompanies particular content designators). For example, subfield $x in field 490 (and in some other fields) implies the display constant "ISSN", and the combination of tag 780 and second indicator value "3" implies the display constant "Superseded in part by:". Such display constants are not carried in the data, but may be supplied for display by the processing system.

4.5. The USMARC Formats support the sorting of data only to a limited extent. In general, sorting must be accomplished through the application of external algorithms to the data.

5. **Organization of the Record**

5.1. A MARC record consists of three main sections: (1) the Leader, (2) the Directory, and (3) the Variable Fields.

5.2. The **Leader** consists of data elements which contain coded values and are identified by relative character position. Data elements in the Leader define parameters for processing the record. The Leader is fixed in length (24 characters) and occurs at the beginning of each MARC record.

5.3. The **Directory** contains the field identifier ("tag"), starting location and length of each field within the record. Directory entries for variable control fields appear first, in tag order. Entries for variable data fields follow, arranged in ascending order according to the first character of the tag. The order of fields in the record does not necessarily correspond to the order of directory entries. Duplicate tags are distinguished only by location of the respective fields within the record. The length of the directory entry is defined in the Entry Map elements in the Leader. In the USMARC Formats, the length of the directory entry is 12 characters. The Directory ends with a "field terminator" character.

5.4. The data content of a record is divided into **Variable Fields.** The USMARC Formats distinguish two types of variable fields: **Variable Control Fields** and **Variable Data Fields.** Control and data fields are distinguished only by structure (see section 7.2 below). [The term "fixed fields" is occasionally used in MARC documentation, referring either to control fields generally or only to coded-data fields such as 007 or 008.]

6. **Variable Fields and Tags**

6.1. The data in a MARC record is organized into fields, each identified by a three-character tag.

6.2. According to ANSI Z39.2–1979, the tag must consist of alphabetic or numeric basic characters (such as decimal integers 0–9 or lower-case letters a–z). To date, the USMARC Formats have used only numeric tags.

6.3. The tag is stored in the directory entry for the field, not in the field itself.

6.4. Variable fields are grouped into blocks according to the first character of the tag, which identifies the function of the data within a traditional catalog record (such as main entry, added entry, subject entry). The type of information in the field (such as personal name, corporate name, title) is identified by the remainder of the tag.

6.4.1. For bibliographic records, the blocks are:

0XX = Variable control fields, identification and classification numbers, etc.

1XX = Main e..try
2XX = Titles and title paragraph (title, edition, imprint)
3XX = Physical description
4XX = Series statements
5XX = Notes
6XX = Subject added entries
7XX = Added entries other than subject, series
8XX = Series added entries
9XX = Reserved for local implementation

6.4.2. For authority records, the blocks are:

0XX = Variable control fields, identification and classification numbers, etc.
1XX = Heading
2XX = General see references
3XX = General see also references
4XX = See from tracings
5XX = See also from tracings
6XX = Treatment decisions, notes, cataloger-generated references
7XX = Not defined
8XX = Not defined
9XX = Reserved for local implementation

6.5. Certain blocks contain data which may be subject to authority control (1XX, 4XX, 6XX, 7XX, 8XX for bibliographic records; 1XX, 4XX, 5XX for authority records).

6.5.1. In these blocks, certain parallels of content designation are preserved. The following meanings are generally given to the final two characters of the tag:

X00 = Personal name
X10 = Corporate name
X11 = Conference name
X30 = Uniform title heading
X40 = Bibliographic title
X50 = Topical subject heading
X51 = Geographic name

Further content designation (indicators and subfield codes) for data elements subject to authority control are consistently defined across the bibliographic formats and in the authorities format. These guidelines apply only to the main range of fields in each block, not to secondary ranges such as the linking fields in 760–787 or the 87X fields. [Numerous exceptions to this principle presently exist in the formats.]

6.5.2. Within fields subject to authority control, data elements may exist which are not subject to authority control and which may vary from record to record containing the same heading (for example, subfield $e, Relator). Such data elements are not appropriate for inclusion in the 1XX field in the authorities format.

6.5.3. In fields not subject to authority control, each tag is defined independently. Parallel meanings have been preserved whenever possible, however.

6.6. Certain tags have been reserved for local implementation. Except as noted below, the USMARC Formats specify no structure or meaning for local fields. Communication of such fields between systems is governed by mutual agreements on the content and content designation of the fields communicated.

6.6.1. The 9XX block is reserved for local implementation.

6.6.2. In general, any tag containing the character "9" is reserved for local implementation within the block structure (see section 6.4 above).

6.6.3. The historical development of the USMARC Formats has left the following exceptions to this general principle:

009 Physical description fixed field for archival collections
039 Level of bibliographic control and coding detail
359 Rental price
490 Series untraced or traced differently

6.7. Theoretically, all fields (except 001 and 005) may be repeated. The nature of the data often precludes repetition, however. For example, a bibliographic record may contain only one title (field 245) and an authority record, only one entry (1XX fields). The repeatability/nonrepeatability of each field is defined in the USMARC Formats.

7. Variable Control Fields

7.1. 00X fields in the USMARC Formats are variable control fields.

7.2. Variable control fields consist of data and a field terminator. They do not contain either indicators or subfield codes (see section 8.1 below).

7.3. Variable control fields contain either a single data element or a series of fixed-length data elements identified by relative character position.

8. Variable Data Fields

8.1. Three levels of content designation are provided for variable fields in ANSI Z39.2–1979:

(1) a three-character tag, stored in the directory entry;
(2) indicators stored at the beginning of each variable data field, the number of indicators being reflected in the Leader, byte 10; and

(3) subfield codes preceding each data element, the length of the code being reflected in the Leader, byte 11.

8.2. All fields except 00X are variable data fields.

8.3. **Indicators**

8.3.1. Indicators contain codes conveying information which interprets or supplements the data found in the field.

8.3.2. The USMARC Formats specify two indicator positions at the beginning of each variable data field.

8.3.3. Indicators are independently defined for each field. Parallel meanings are preserved whenever possible, however.

8.3.4. Indicator values are interpreted independently—that is, meaning is not ascribed to the two indicators taken together.

8.3.5. Indicators may be any lower-case alphabetic or numeric character or the blank. Numeric values are assigned first. A blank is used in an undefined indicator position, or to mean "no information supplied" in a defined indicator position.

8.4. **Subfield Codes**

8.4.1. Subfield codes distinguish data elements within a field which do (or might) require separate manipulation.

8.4.2. Subfield codes in the USMARC Formats consist of two characters—a delimiter [$1F_{16}$, 8-bit; 37_8, 6-bit], followed by a data element identifier. Identifiers defined in the USMARC communications formats may be any lower-case alphabetic or numeric character.

8.4.2.1. In general, numeric identifiers are defined for parametric data used to process the field, or coded data needed to interpret the field. (Note that not all numeric identifiers defined in the past have in fact identified parametric data.)

8.4.2.2. Alphabetic identifiers are defined for the separate elements which constitute the data content of the field.

8.4.2.3. The character "9" and the following graphic symbols are reserved for local definition as subfield identifiers: 9 ! " # $ % & ' ( ) * + , - . / : ; < = > ?

8.4.3. Subfield codes are defined independently for each field. Parallel meanings are preserved whenever possible, however.

8.4.4. Subfield codes are defined for purposes of identification, not arrangement. The order of subfields is specified by content standards, such as the cataloging rules. In some cases, such specifications may be incorporated in the format documentation.

8.4.5. Theoretically, all data elements may be repeated. The nature of the data often precludes repetition, however. The repeatability/nonrepeatability of each subfield code is defined in the USMARC Formats.

9. **Coded Data**

9.1. In addition to content designation, the USMARC Formats include specifications for the content of certain data elements, particularly those which provide for the representation of data by coded values.

9.2. Coded values consist of fixed-length character strings. Individual elements within a coded-data field or subfield are identified by relative character position.

9.3. Although coded data occurs most frequently in the Leader, Directory, and Variable Control Fields, any field or subfield may be defined for coded-data elements.

9.4. Certain common values have been defined:

b = Undefined
n = Not applicable
u = Unknown
z = Other
| = Fill character [i.e., No information provided]

Historical exceptions to occur in the formats. In particular, the blank (b) has often been defined as "not applicable," or has been assigned a meaning.

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Film Preservation: A Large Piece Of Americana Is Fading Away

By FRANK HODSOLL
(Chairman, National Endowment for the Arts)

During my first year as Chairman, the National Endowment for the Arts hosted a series of special seminars across the country. At the Media Arts Seminar in Minneapolis, the panelists included Robert Redford, Robert Wise, Jane Alexander, George Schaefer, Fay Kanin, Jean Firstenberg, and other important representatives from the commercial and noncommercial world of film, video, and radio.

A great number of issues and problems were discussed at the seminar, but the most striking presentation concerned film preservation. I was appalled to learn that one-half of the theatrical films produced before 1952 have already been irretrievably lost due to the decay and neglect. Under present conditions, most of the remaining half will not survive this century.

The early black-and-white motion pictures are not the only films in jeopardy. Organic dyes used in the color films of the last 30 years fade rapidly when stored in less than ideal conditions. Videotape images, like those on color film, are also susceptible to rapid deterioration. The visual record of twentieth century America is fading faster than our memories.

American films and American television have shaped, influenced, and substantially contributed to American culture. Many people believe that film is perhaps our most significant and most distinctive contribution to international art and culture.

It is virtually impossible to conceive of a film that does not instruct us in the art, the social perspectives, and the history of a particular period. Every film is a time capsule which tells us how we saw ourselves, and how others saw us, at a point in our past. The disappearance of a film or archival videotape is therefore not only a loss of an artistic object, it is also a partial obliteration of our nation's history.

Most of the film and video losses suffered to date are a direct result of neglect and the lessened commercial value of older productions. Fire claimed many improperly stored collections. The inventories of defunct studios and distributors were discarded.

Other companies destroyed films to regain their silver content or to make space for newer, more marketable works. Videotape has the unfortunate quality of being reusable as recording stock. Time, chemistry, and the marketplace seem to collude against all moving images.

Between 1889 and 1952, most commercial black and white films were produced on nitrocellulose (or "nitrate") film stock. Nitrate film was suitably flexible and transparent, but it was also highly flammable and tended to decompose within a few years. Because most films had a very short commercial lifespan, durability was not a important marketing consideration for film manufacturers.

Nitrate decomposition can occur in as few as 15 years. Only a handful of films have lasted more than 50 years. Of the 11,000 American feature films produced before 1930, less than one in five have escaped fire, decay, or destruction by other means.

Nitrate films can be preserved by transferring their images to the newer "safety base" acetate films. Over the last 15 years, the nation's major film archives (including the Library of Congress and the National Archives) have managed to transfer and preserve 54,000,000 feet of nitrate film. To date, this effort has cost about $17,000,000.

The problem is that these archives still hold 110,000,000 feet of unpreserved film, and it is estimated that another 110,000,000 feet is in the hands of film studios, private collectors, etc. Because of the short natural lifespan of nitrate, time has run out for most of this footage. To preserve 80% of only the archives' nitrate films, another $30-40,000,000 is urgently needed.

Color Film

In the 1950s, Eastman Kodak introduced Eastmancolor, a film process that was simpler and far less expensive than Technicolor. The process was franchised under trade names such as Warnercolor, Color by Deluxe, etc.

Organic color dyes used in this process are unstable and tend to fade. Green and yellow are the first color elements to disappear and this has a noticeable effect on outdoor scenes and fleshtones. In the final stages of color deterioration, the entire image is reduced to a one-color, pinkish purple hue.

Prints of color films begin fading with a few years of their release. Color negatives fade

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APPENDIX E

about five times more slowly than prints, but many negatives begin fading within 10 years.

At this time, there are only two methods of preserving color films. The first is by making black and white separations. In this process, an image of each primary color is permanently recorded on separate rolls of black and white film.

Disney and MGM regularly perform color separations on their feature films. Other studios do so for films that clearly have future commercial potential. However, it costs between $25,000 and $30,000 to preserve a single feature in this manner.

This would appear a small sum for what is often a multi-million dollar investment. Nevertheless producers with little concern about the long-term commercial or historical value of their films will not invest the additional funds for color separation. The archives that hold early color films cannot afford to spend this amount on any single film.

Cold storage is the second method of color film preservation. The organic color dyes fade less rapidly in colder, less humid conditions. At temperatures near freezing and at a relative humidity of 30 or 40% the life of a film can probably be extended for hundreds of years.

Unfortunately, adequate cold storage film vaults are not generally available in the U.S. NASA has a small vault for the early space flight films, and the Kennedy Library in Massachusetts has a vault for its collection.

Other institutions have temperature controlled vaults which could be reduced to near freezing but are not because of energy costs.

Television

Television has been our chief record of public events since the 1950s. Live and prerecorded television programming has often made important contributions to our nation's culture and art. Because of its relatively low cost, video has emerged as the preferred medium for many independent producers and media artists.

Unfortunately, videotape is also impermanent. Repeated viewings lend to image deterioration, as does improper storage conditions. The technology is so new that little is known about the long-term potential of magnetic tape. It is known that most tape will not maintain a quality image for more than five to 15 years without conservation efforts.

One-half of the live network television programming produced in the 1950s was either not

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recorded on a permanent medium or has been lost. The Library of Congress, the Museum of Broadcasting in New York, the National Archives, UCLA, and the American Film Institute have been working to obtain and preserve important materials from the last three decades, but the magnitude of the problem is overwhelming.

It has been estimated that almost 200,000 hours of television programming are now in need of immediate conservation care. Most conservation techniques are time-consuming and therefore expensive.

Because no conservation technique can permanently preserve a videotape, conservation efforts must be repeated on a regular basis for each tape. As the mountain of video programming grows each year, the prospect for properly storing and maintaining a significant portion of this material is bleak.

Archivists are particularly concerned because the vast majority of television films and tapes are now held in the vaults of the major networks and various independent producers. Their conservation efforts are often minimal.

Several years ago, the entire collection of Steve Allen "Tonight Show" were burned by a warehouse manager who needed more shelf space. Very few of television's pioneers can locate representative samples of their work. It is a great pity that the television industry appears doomed to repeat the mistakes of the film industry.

Past Efforts

Until the late 1960s, only four national cultural institutions — the George Eastman House, the Library of Congress, the Museum of Modern Art, and the National Archives — were collecting significant amounts of film and television materials. In 1967, their combined film preservation expenditures amounted to approximately $150,000 per year.

The National Endowment for the Arts began funding film preservation in 1967. The American Film Institute was encouraged to create a film archive program to help administer the Arts Endowment's preservation grants and coordinate preservation activities among the various archives.

The Endowment's matching grants of $250,000 for the preservation of nitrate film helped raise total preservation expenditures to a peak of $2,500,000 from the private sector in 1981.

It has been calculated that the total Endowment funding of $6,500,000 in the past 15 years stimulated almost $17,000,000 in nitrate preservation work. As a result, about 14,000 films (shorts and features) have been saved.

This small boom in preservation activity heightened awareness of the preservation problem and encouraged other institutions to collect and preserve endangered film and television materials. In order to coordinate archival efforts and avoid duplication of work, a Film Archives Advisory Committee with representatives from the 15 largest archives was created.

No funds are now committed to preserving a film until all archives report that they do not have a preserved copy in their collection.

The coordination efforts of the Advisory Committee and the AFI have led to a national archival network that is geographically diverse and non-duplicative. The collections vary greatly in size, but the quality of the archival work is uniformly excellent.

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Future Plans

The past 15 years can be viewed as the birth of the preservation "movement." A handful of separate institutions were doing excellent work before 1967, but national recognition and response to the problem is a relatively recent phenomenon.

The magnitude of film and television losses is only now beginning to dawn upon many artists, scholars, industry executives, and the public at large. It is our hope that these individuals, in conjunction with the archives, can work together to preserve the remaining examples of early film and television art.

Unless a dramatic surge in preservation activities occurs within the next 10 years, tens of thousands of important films and televisions programs could be forever lost.

To assist the nation's archives in their effort to cope with the growing preservation problem, the Arts Endowment plans to support several special film preservation activities in the near future. At this point, the Endowment's preservation program can be divided into three categories: archival information systems, preservation, and public awareness.

In order to facilitate a substantial growth in preservation activity, the Endowment will help support the development of a computerized archival catalog information system. None of the archives currently has all relevant information about its collection on computer, and the existing systems are incompatible.

Without a national archival information system, efforts to avoid duplicative preservation work are often cumbersome. Informed decisions about preservation priorities will continue to be difficult to make until the contents and physical condition of films in major collections across the country are listed in one database.

In order to help resolve this information problem, the NBA will fund a special computer cataloging conference at the Museum of Modern Art early next year. The conference report should serve as a blueprint for the creation of the necessary information system.

The Endowment will also be contributing to the resumption of the AFI Catalog project. The catalogs will be a complete listing of all relevant bibliographic data for every American theatrical film produced between 1893 and the present. When this data is cross-referenced with the archival information system, preservation priorities can be further refined.

The problem of nitrate preservation is one of insufficient funding. Millions of dollars must be raised within the next 10 years if the bulk of unpreserved nitrate films are to be saved. The amount of funds required far exceed the Endowment's limited resources for this program.

I expect the Endowment will continue its nearly $500,000-per-year preservation efforts. We also plan to help with areas of opportunity where our funds can be catalytic and increase our efforts as an advocate of greater preservation funding.

It is possible that most of our film heritage can be saved at a cost of, say, $5,000,000 per year over the next 10 years. This seems to be a small price to pay for preserving such a significant part of 20th century American art and culture.

The above price tag would include developing a film information system, conversion of the balance of archival nitrate stock, the construction of proper archival cold storage facilities on the east and west coasts, and support of efforts to increase awareness of the problem.

A few archives on the east coast are now discussing the possibility of constructing and maintaining a cooperative cold storage facility.

The above estimate does not cover the cost of video pres-

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Part Of Americana Is Slipping Away

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ervation. Because of unresolved technical questions and the urgent demands of nitrate and color film preservation, the NEA's immediate priority will continue to be film preservation.

This should not be construed as an attempt to minimize the need for video preservation. It is a problem of national significance.

Regarding the increase of public and industry awareness, the Endowment plans to co-fund a short film about preservation that will be produced by the AFI.

The film will be used by the archives to educate the public and to encourage potential donors to support film preservation activities. the AFI and the archives will be developing public awareness in their own ways, and plan fundraising events during the next few years to support what the AFI has termed "The Decade of Preservation."

It is my hope that the film and television industry will substantially increase its involvement in preservation activities during the next year.

The archives need financial support, they need moral support, and they need the cooperation of film companies and film artists in addition to those forward looking individuals who have already made themselves heard. Without a successful union of this sort, it is doubtful that film and television archivists can beat the race against the clock.

I encourage all industry executives to examine and further open their companies' lines of communication with the major archives. I appeal to all executives with personal collections of vintage film or television productions to alert the archives to the existence of these materials. If you need advice about which institution to contact, start by calling Lawrence Karr, the director of the American Film Institute's preservation program.

It is unthinkable that our children will grow up into a world so bland that their visions will no longer be tantalized by the colors of Renoir or Chagall.

It should be equally unthinkable that our children could inhabit a world no longer enlarged and defined by the artistry of Chaplin, the vision of Orson Welles, the magic of Melies.

But, if Mozart and Keats have their protectors, Chaplin and Welles may well fade into somethink less than memory. Our task is to keep this from happening.

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